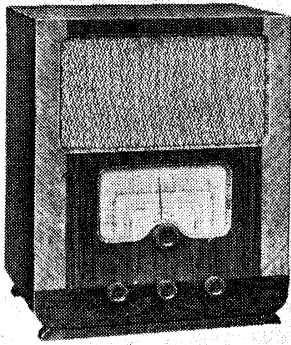


"TRADER" SERVICE SHEET

# 395

# ALBA 335

## 320 AND 455



The Alba 335 table receiver, a 3-band battery superhet.

**T**HE Alba 335 is a table model battery 3-band superhet, with a SW range of 19.5 to 50 m. It employs six valves, including a hexode RF amplifier, hexode mixer, triode oscillator, hexode IF amplifier, double diode triode second detector, AVC and AF amplifier, and a pentode output valve.

There is provision for a gramophone pick-up, switched into circuit in the fourth position of the wavechange switch, and this also switches off the first four valves.

Model 320 is an earlier receiver incorporating an identical chassis, while model 455 is a radiogram version of the same chassis.

This Service Sheet was prepared on a model 335.

Release dates: 320, March, 1937; 455, July, 1937; 335, July, 1938.

### CIRCUIT DESCRIPTION

Aerial input via coupling coils **L1** (SW), **L2** (MW) and **L3** (LW) to single-tuned circuits **L4**, **C22** (SW), **L5**, **C22** (MW) and **L6**, **C22** (LW) which precede RF amplifying valve (**V1**, Mullard metallised VP2B), a variable-mu hexode.

Tuned-secondary RF transformer coupling by **L7**, **L10**, **C26** (SW), **L8**, **L11**, **C26** (MW) and **L9**, **L12**, **C26** (LW) between **V1** and a second variable-mu hexode (**V2**, Mullard metallised VP2B) which operates as frequency changer with suppressor grid injection in conjunction with separate triode oscillator valve (**V3**, Mullard metallised PM2DX). Oscillator grid coils **L16** (SW), **L17** (MW) and **L18** (LW) are tuned by **C32**; parallel trimming by **C27** (SW), **C28** (MW) and **C29** (LW); series tracking by **C30** (MW) and **C31** (LW). Reaction by anode coils **L13** (SW), **L14** (MW) and **L15** (LW).

Fourth valve (**V4**, Mullard metallised

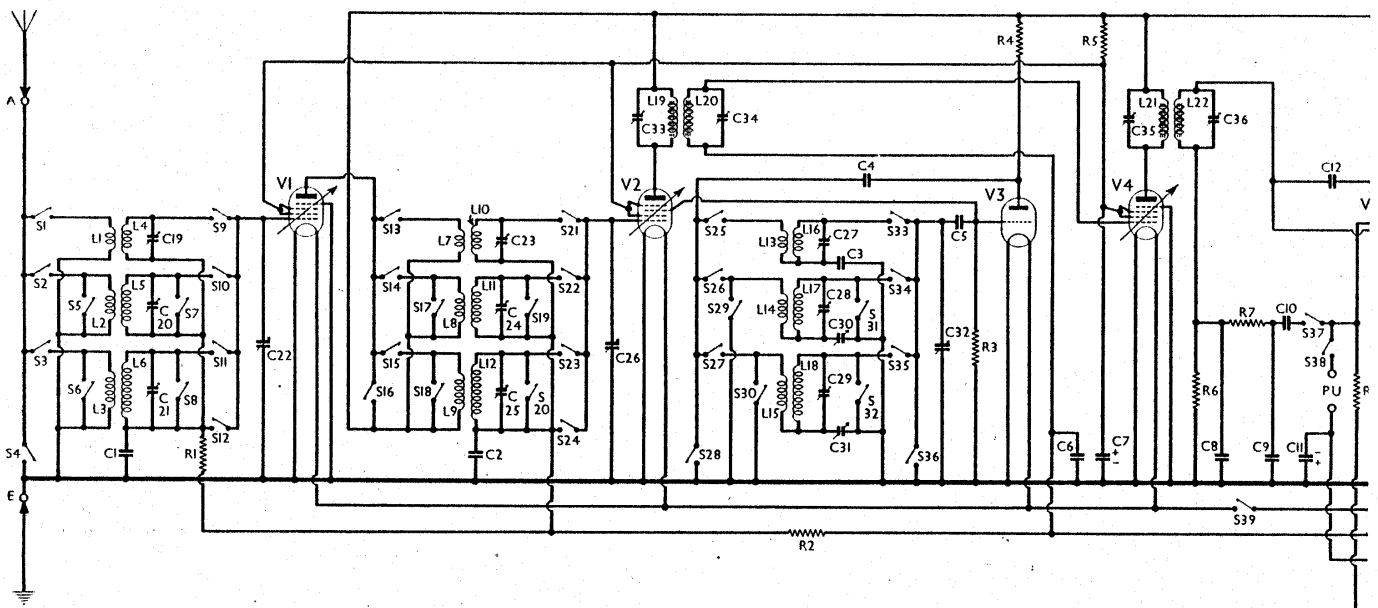
VP2B) is a further variable-mu RF hexode, operating as intermediate frequency amplifier with tuned-primary tuned-secondary transformer couplings **C33**, **L19**, **L20**, **C34** and **C35**, **L21**, **L22**, **C36**.

### Intermediate frequency 460 KC/S.

Diode second detector is part of double diode triode valve (**V5**, Mullard metallised TDD2A). Audio frequency component in rectified output is developed across load resistance **R6** and passed via **R7**, AF coupling condenser **C10**, and **S37** to CG of triode section, which operates as AF amplifier. IF filtering by **C8**; **R7**, **C9** and **C13**. Provision for connection of gramophone pick-up across triode CG resistance **R8** via **S38**; when **S38** is closed, **S37** opens together with **S39**, which controls the filament current to **V1**, **V2**, **V3** and **V4**, to mute radio.

Resistance-capacity coupling by **R9**, **C14** and manual volume control **R12** between **V5** triode and pentode output valve (**V6**, Mullard PM22D). Fixed tone correction by **C15**, and variable tone control by **C16**, **R13**, in anode circuit.

Automatic GB circuit **R14**, **R15** in negative HT lead to chassis, which is by-passed by electrolytic condensers **C11** and **C18**, provides fixed GB potential for **V1**, **V2** and **V4**, AVC delay voltage, **V5** triode and **V6** GB. **V5** triode GB on gram is reduced to approximately half its value as used on radio.



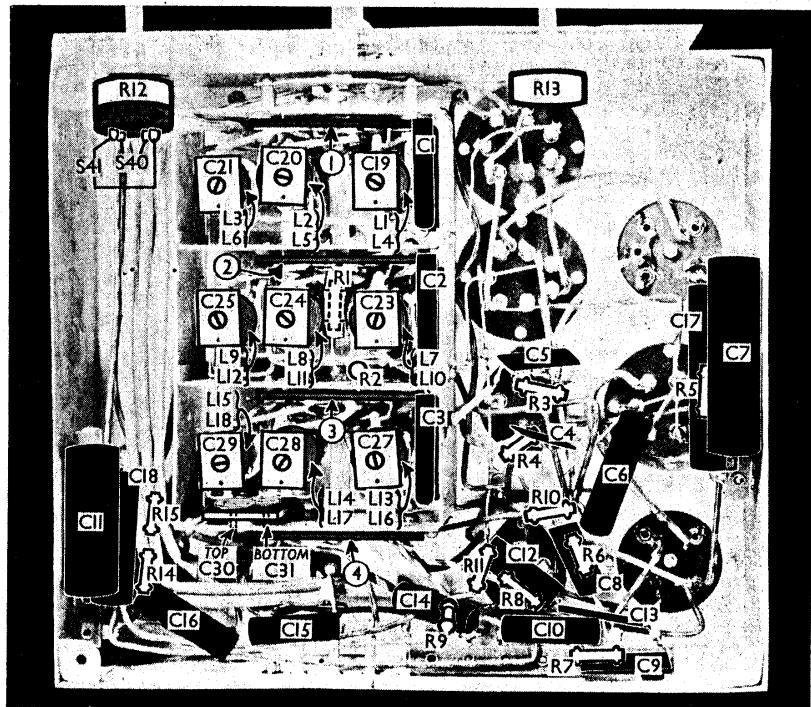
Circuit diagram of the Alba 335. Both the 320 and the 455 have identical circuits. Note the switch **S39** which breaks the filament circuit.

# COMPONENTS AND VALUES

RESISTANCES		Values (ohms)
R1	V1 CG decoupling ..	250,000
R2	AVC line decoupling ..	250,000
R3	V3 CG resistance ..	30,000
R4	V3 anode HT feed ..	25,000
R5	V1, V2, V3 SG's HT feed ..	40,000
R6	V5 signal diode load ..	500,000
R7	IF stopper ..	50,000
R8	V5 triode CG resistance ..	1,000,000
R9	V5 triode anode load ..	20,000
R10	AVC line decoupling ..	250,000
R11	V5 AVC diode load ..	500,000
R12	Manual volume control ..	500,000
R13	Variable tone control ..	50,000
R14	V1, V2, V4 fixed GB, V5 triode ..	100
R15	and V6 GB resistances ..	100

CONDENSERS		Values (μF)
C1	V1 CG decoupling ..	0.01
C2	V1 CG decoupling ..	0.01
C3	Osc. circuit SW tracker ..	0.0045
C4	V3 anode coupling ..	0.0002
C5	V3 CG condenser ..	0.0001
C6	V4 CG decoupling ..	0.1
C7*	V1, V2, V4 SG's decoupling ..	2.0
C8	IF by-pass condensers ..	0.0001
C9	IF by-pass ..	0.0002
C10	AF coupling to V5 triode ..	0.002
C11*	Auto GB by-pass ..	25.0
C12	Coupling to V5 AVC diode ..	0.0002
C13	IF by-pass ..	0.0001
C14	V5 triode to V6 AF coupling ..	0.005
C15	Fixed tone corrector ..	0.005
C16	Part of variable tone control ..	0.05
C17*	HT reservoir condenser ..	50.0
C18*	Auto GB circuit by-pass ..	—
C19*	Aerial circuit SW trimmer ..	—
C20*	Aerial circuit MW trimmer ..	0.00003
C21*	Aerial circuit LW trimmer ..	0.00003
C22*	Aerial circuit tuning ..	—
C23*	RF trans. SW sec. trimmer ..	0.00003
C24*	RF trans. MW sec. trimmer ..	0.00003
C25*	RF trans. LW sec. trimmer ..	0.00003
C26*	RF trans. sec. tuning ..	—
C27*	Osc. circuit SW trimmer ..	0.00003
C28*	Osc. circuit MW trimmer ..	0.00003
C29*	Osc. circuit LW trimmer ..	0.00003
C30*	Osc. circuit MW tracker ..	0.0006
C31*	Osc. circuit LW tracker ..	0.0003
C32*	Oscillator circuit tuning ..	—
C33*	1st IF trans. pri. tuning ..	—
C34*	1st IF trans. sec. tuning ..	—
C35*	2nd IF trans. pri. tuning ..	—
C36*	2nd IF trans. sec. tuning ..	—

\* Electrolytic. † Variable. ‡ Pre-set.



Under-chassis view. Diagrams of the four switch units are overleaf. Note the two trackers C30 and C31. S40 and S41 are the battery circuit switches, ganged with R12.

OTHER COMPONENTS		Approx. Values (ohms)
L1	Aerial SW coupling coil ..	0.4
L2	Aerial MW coupling coil ..	14.0
L3	Aerial LW coupling coil ..	48.0
L4	Aerial SW tuning coil ..	0.05
L5	Aerial MW tuning coil ..	3.5
L6	Aerial LW tuning coil ..	26.0
L7	RF trans. SW primary ..	0.6
L8	RF trans. MW primary ..	1.0
L9	RF trans. LW primary ..	18.0
L10	RF trans. SW secondary ..	0.05
L11	RF trans. MW secondary ..	3.5
L12	RF trans. LW secondary ..	26.0
L13	Oscillator SW reaction coil ..	0.9
L14	Oscillator MW reaction coil ..	50.0
L15	Oscillator LW reaction coil ..	3.8
L16	Osc. circuit SW tuning coil ..	0.05
L17	Osc. circuit MW tuning coil ..	7.2
L18	Osc. circuit LW tuning coil ..	12.0
L19	1st IF trans. Pri. ..	5.0
L20	1st IF trans. Sec. ..	5.0
L21	2nd IF trans. Pri. ..	5.0
L22	2nd IF trans. Sec. ..	5.0
L23	Speaker speech coil ..	2.0
T1	Speaker input trans. Pri. ..	800.0
T1	Speaker input trans. Sec. ..	0.3
S1-S36	Waveband switches ..	—
S37-39	Radio/Gram change switches ..	—
S40	Main LT circuit switch ..	—
S41	HT circuit switch ..	—

## DISMANTLING THE SET

**Removing Chassis.**—To remove the chassis, remove the four control knobs (set screws) and the four bolts (each with one metal and two rubber washers), and unsolder the two leads from the speaker transformer, when the chassis can be withdrawn from the cabinet. *When replacing*, the white lead should be connected to the upper tag and the black lead to the lower tag.

**Removing Speaker.**—If it is necessary to remove the speaker from the cabinet,

disconnect the two leads and remove the four hexagon nuts (with washers) holding the speaker to the sub-baffle. *When replacing*, the transformer should be on the right of the speaker and the leads connected as indicated above.

## VALVE ANALYSIS

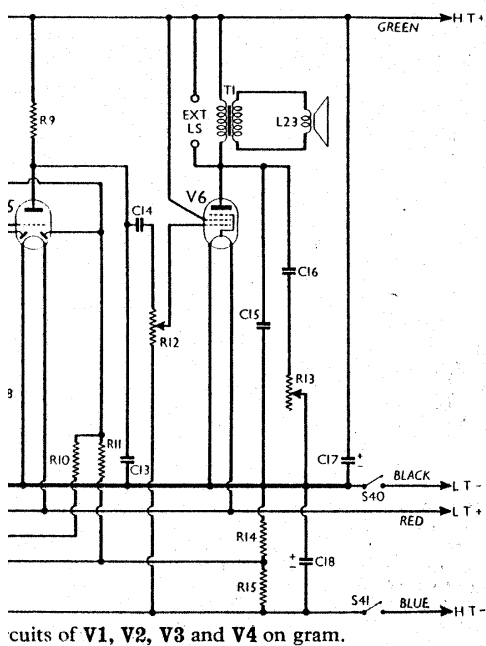
Valve voltages and currents given in the table below are those measured in our receiver when it was operating with an HT battery reading 132 V on load. The receiver was tuned to the lowest wavelength on the MW band and the volume control was at maximum, but there was no signal input.

Voltages were measured on the 400 V scale of a model 7 Universal Avometer, chassis being negative.

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 VP2B ..	127	1.0	35	0.3
V2 VP2B ..	127	0.75	35	0.85
V3 PM2DX ..	64	2.6	—	—
V4 VP2B ..	127	1.4	35	0.45
V5 TDD2A ..	104	0.7	—	—
V6 PM22D ..	122	4.3	127	0.65

## GENERAL NOTES

**Switches.**—S1-S36 are the wavechange, and S37-S39 the radio/gram change switches, ganged in four rotary units beneath the chassis. These are indicated in our under-chassis view, and shown



cuits of V1, V2, V3 and V4 on gram.

in detail in the diagrams in col. 3. The table (col. 2) gives the switch positions for the four control settings, starting from fully anti-clockwise. A dash indicates open, and **C** closed.

**S40, S41** are the main LT and the HT circuit switches, in a QMB unit, ganged with the volume control **R12**. The tags belonging to each of these are indicated in the under-chassis view.

**Coils.**—All the RF and oscillator coils are in pairs in nine tubular units in a screened compartment beneath the chassis. Each unit has a trimmer fitted at its top. In the case of the SW units the thick wire windings are **L4, L10** and **L16** respectively.

The IF transformers **L19, L20** and **L21, L22** are in two screened units on the chassis deck, with their associated trimmers.

**External Speaker.**—Two terminals are provided on the internal speaker connection panel for a high impedance (24,000  $\Omega$ ) external speaker. In our case, however, the terminals were found not to be connected up. If this is the case in other models, their tags should be connected to the adjacent tags of the primary of **T1**, to which the two leads from the chassis are also connected.

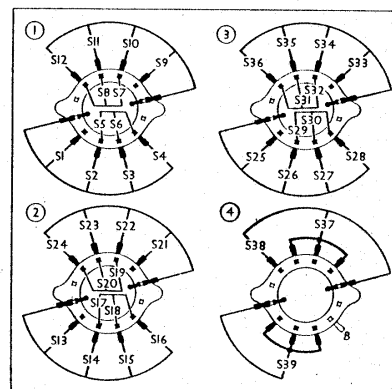
**Trackers C30, C31.**—These are adjusted by screws at the rear of the tuning pack, and two holes are provided at the rear of the chassis enabling the screws to be reached.

**Resistance R2.**—This is shown in the makers' diagram between the common connection of **L10, L11, L12** and the AVC line.

**Batteries.**—Recommended batteries are: LT, 2 V 45 AH multi-plate accumulator cell; HT, 135 V double capacity dry battery. Grid bias is automatic.

TABLE AND DIAGRAMS OF THE SWITCH UNITS

Switch	SW	MW	LW	Gram.
S1	C	—	—	—
S2	—	C	—	—
S3	—	—	C	—
S4	—	—	—	C
S5	C	—	—	—
S6	C	C	—	—
S7	C	—	—	—
S8	C	C	—	—
S9	C	—	—	—
S10	—	C	—	—
S11	—	—	C	—
S12	C	—	—	C
S13	—	—	—	—
S14	—	C	—	—
S15	—	—	C	—
S16	—	—	—	C
S17	C	—	—	—
S18	C	C	—	—
S19	C	—	—	—
S20	C	C	—	—
S21	C	—	—	—
S22	—	C	—	—
S23	—	—	C	—
S24	—	—	—	C
S25	C	—	—	—
S26	—	C	—	—
C27	—	—	C	—
C28	—	—	—	C
C29	C	—	—	—
C30	C	C	—	—
S31	C	—	—	—
S32	C	C	—	—
S33	C	—	—	—
S34	—	C	—	—
S35	—	—	C	—
S36	—	—	—	C
S37	C	C	C	C
S38	C	C	C	C
S39	C	C	C	—



Diagrams of the four switch units, as seen from the rear of the underside of the chassis, and numbered in accordance with the under-chassis view. The fourth unit contains the radio gram switches.

Connect signal generator to **A** and **E** sockets.

**SW.**—Switch set to SW, tune to 20 m on scale, feed in a 20 m (15 MC/S) signal and adjust **C27**, then **C23** and **C19**, for maximum output.

**MW.**—Switch set to MW, tune to 200 m on scale, feed in a 200 m (1,500 KC/S) signal, and adjust **C28**, then **C24** and **C20**, for maximum output. Feed in a 500 m (600 KC/S) signal, tune it in, and adjust **C30** for maximum output, while rocking the gang for optimum results.

**LW.**—Switch set to LW, tune to 900 m on scale, feed in a 900 m (333 KC/S) signal, and adjust **C29**, then **C25** and **C21**, for maximum output. Feed in a 1,900 m (158 KC/S) signal, tune it in, and adjust **C31** for maximum output, while rocking the gang for optimum results.

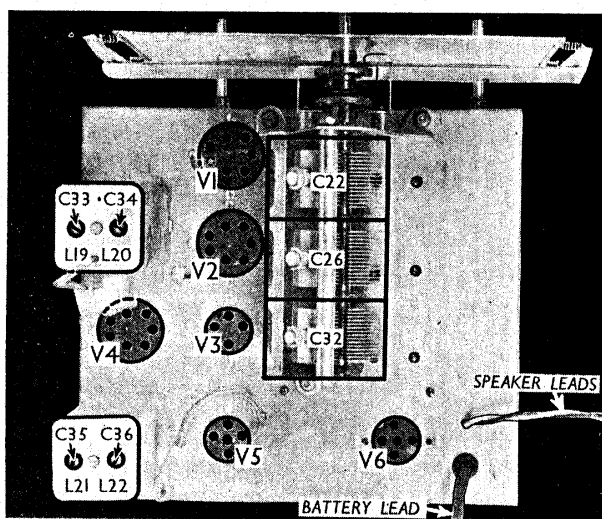
**Battery Leads and Voltages.**—Black lead, spade tag, LT negative; red lead, spade tag, LT positive 2 V; blue lead, black plug, HT negative; green lead, red plug, HT positive 135 V.

**Radiogram Model.**—In Model 455 the same chassis is employed, with the addition of a pick-up and a spring-driven motor.

## CIRCUIT ALIGNMENT

**IF Stages.**—Connect signal generator to control grid (top cap) of **V2** and chassis, feed in a 460 KC/S signal, and adjust **C33, C34, C35** and **C36** in turn for maximum output.

**RF and Oscillator Stages.**—With gang at maximum, pointer should be horizontal.



Plan view of the Alba 335 chassis. As will be seen, there are no trimmers on the actual gang condenser, and except for the IF trimmers, **C33-C36**, all alignment is carried out from beneath the chassis.

## Service Hints Wanted

Service engineers are invited to submit hints regarding the maintenance of all kinds of domestic electrical, radio and television apparatus—based on their own personal experiences.

They need not worry if they are not able to put their ideas into a form suitable for publication. Send the ideas to "The Trader"—the editorial and technical staffs will do the rest. The same applies to any sketches or circuits, which need be only roughly drawn.

Payment will be made at usual lineage rates for all ideas and paragraphs used—about the 10th of the month following month of publication. Material should be addressed to the Technical Editor, "The Wireless and Electrical Trader," Dorset House, Stamford Street, London, S.E.1.